REMARKS

Claims 1-8 remain pending in this application for which applicant seeks reconsideration.

Amendment

Claims 1, 3, and 7 have been amended. Independent claim 1 has been amended to include the weighting feature of claim 3. No new matter has been introduced.

Art Rejection

Claims 1-8 were rejected under 35 U.S.C. § 103(a) as unpatentable over Asada (USPGP 2002/0091807) in view of Hatae (USP 5,675,655) and Official Notice. The examiner withdrew the previous Asada reference (USPGP 2006/0050897) and replaced it with the current Asada reference, which has an earlier effective date.

Applicant traverses this rejection because the combination urged by the examiner would not have taught at least the claimed branching unit that branches or splits the same input audio signal into two or more signals, which are processed differently from each other and then combined, as set forth in independent claim 1.

The examiner asserts that Asada discloses all the claimed limitations except for the directivity control unit that supplies directivity control information to the first and second delay units. In this respect, the examiner essentially relied upon Asada's embodiments of Figs. 30 and 32 in combination with Hatae to reject the claims. Hatae was relied upon for the proposition that selectively providing a wide and narrow directivity selection would have been obvious. The examiner relied upon Official Notice to indicate that using digital FIR filters would have been obvious.

Asada's Fig. 30 discloses providing bandwidth filters 86a, 86b, 86c suitable for different drivers of the speakers having different playing characteristics, e.g., tweeter, mid-range, base, namely to achieve a flat frequency characteristics over a wide frequency range. See paragraphs 193 and 194. Moreover, Asada discloses that phases can be shifted with filters, and by providing suitable delay components to the filter, the wavefront directivity can be controlled. See paragraphs 195 and 196.

Asada's Fig. 32 discloses providing two independent sound channels/sources 102a, 102b that can be played at the same time through an array speaker system by controlling the delay to each speaker to control sound directivity. That is, the sound source 102a can be directed in the direction AA while the sound source 102b can be directed in the direction BB at

the same time to play multiple sources or channels. Here, the signals from both sources 102a, 102b are added and input to each of the speakers.

Previously presented independent claim 3, which is directed to the embodiment of Fig. 9, called for a branching unit (e.g., 800) that splits the same audio signal to the first and second delay units (e.g., 300, 300'), which provide a first delay for one of the branched audio signals and supplies first delay processed signals to each of the loudspeakers (e.g., 210-1 to 210-n) in accordance with first provided directivity control information from a directivity control unit (e.g., 400), and a second delay for another of the branched audio signals and supplies second delay processed signals to each of the loudspeakers (e.g., 210-1 to 210-n) in accordance with second provided directivity control information from the directivity control unit. The directivity control unit (e.g., 400) generates the first directivity control information and the second directivity control information so that a directional characteristic of the array speaker unit obtained by the first delay differs from the directional characteristic of the array speaker unit obtained by the second delay, and supplies the generated information respectively to the first delay unit and the second delay unit. The adding unit (e.g., 900) adds the first and second delay processed signals applied to each of the respective loudspeakers.

In contrast, Asada's Fig. 32 discloses feeding the signal from the first sound source/channel 102a only to the first delay unit 103a (103a1, 103a2, 103a3, 103a4) while feeding the sound signal from the second sound source/channel 102b only to the second delay unit 103b (103b1, 103b2, 103b3, 103b4). In other words, Asada does not teach the claimed branching unit that feed the same audio signal to both the first and second delay units 103a, 103b. Moreover, while Asada's Fig. 30 discloses splitting the same signal, it does not disclose or teach feeding the same signal through two different delay circuits and adding the delayed signals, let alone feeding the combined signals to each of the loudspeakers. Indeed, in Asada's Fig. 30, each of the split signals, which are independently processed, is fed only to a single dedicated speaker, and not to all of the speakers.

Asada's Fig. 28, however, appears to disclose feeding different components of filtered signals to different speakers. Specifically, switches 75, 76, 77 are provided to selectively direct the filtered signals from different filters 74a, 74b, 74c to the speakers via an adder/mixer 78a, 78b, 78c. Although the same signal 73 (source) is split three ways, the split signals are not delay processed, let alone feeding the same sound signal to the first and second delay units, as set forth in claim 3.

Based on the foregoing, applicant submits that independent claim 3 distinguishes over the applied references, even if Hatae were to teach a wide and narrow directivity selection as urged by the examiner for argument's sake.

Nonetheless, in the interest of expediting prosecution, independent claim 3 has been further amended to include the weighting feature of dependent claim 1 or 7. In rejecting claims 1 and 7, the examiner alleges that Asada's Fig. 30 and 32, namely the power amplifiers 87a-87c and 105a-105e, correspond to the claimed weighting unit. Applicant disagrees because the power amplifier merely amplifies the signals. Asada does not disclose or teach providing gain control information (i.e., gain coefficient) associated with each of the delay processed signals.

Conclusion

In view of the foregoing differences, applicant submits that claims 1-8 patentably distinguish over the applied references and are in condition for allowance. Should the examiner have any issues concerning this reply or any other outstanding issues remaining in this application, applicant urges the examiner to contact the undersigned to expedite prosecution.

Respectfully submitted,

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